

REMARKS

Claims 4-24 remain in the application.

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I. **SUMMARY OF THE OCTOBER 24TH, 2002 OFFICE ACTION**

Section 103 Rejection

In this Final Rejection, claims 4-24 were rejected under 35 U.S.C. § 103(a) as being unpatentable solely over Puntambekar et al. U.S. Patent 5,714,037.

II. **DISCUSSION**

A. **The Question of the Rejection of Claims 4-24 on the Combination of the Puchner et al. and Puntambekar et al. References**

In a telephone interview on Wednesday, December 14, 2002, between Applicants' attorney, John P. Taylor, and Benjamin Utech, Supervisory Patent Examiner in Technology Center 1700, SPE Utech advised Applicants' attorney that Applicants' filing of the Affidavit of Common Ownership effectively removed the Puchner et al. patent as a reference against Applicants' claims. The prior rejection of Applicants' claims over the combination of Puchner et al. and Puntambekar et al. has, therefore, been withdrawn by the USPTO.

B. **The Rejection of Claims 4-24 Solely on the Puntambekar et al. Reference**

Claims 4-24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Puntambekar et al. U.S. Patent 5,714,037. The Rejection states that Puntambekar et al. teach a two step nitrogen plasma process wherein the first step is an initialization step necessary to

strike the plasma. The Office Action then states that during step 2, Puntambekar et al. operate their plasma etcher at a high DC bias of 950 volts. This language concerning the high DC bias utilized during the second step of the Puntambekar et al. process is taken from the Puntambekar et al. patent at column 4, lines 12-16. The patentee goes on to say, in the same column, at line 29, that the range of the DC bias used in their process is 600 volts DC or above.

The Office Action then calls attention to the recitation of an rf power of 400 watts for both steps in Table 1 of Puntambekar et al. From this recitation in the reference, the USPTO draws the conclusion that this reads on Applicants' limitation of maintaining an rf *bias* on the semiconductor substrate. Applicants note, however, three flaws in this reasoning:

- 1) Puntambekar et al. do not state (or infer) that their rf power is a **bias** power or voltage;
- 2) Puntambekar et al. do not state or imply that their recited rf power is coupled to their semiconductor substrate (or the substrate support); and
- 3) the Puntambekar et al. recited minimum rf power of 600 watts (for nitride etching) is 6 times Applicants' maximum rf *bias* power of 100 watts (recited in the first paragraph of Applicants' specification on page 3).

It is, therefore, not surprising that the Rejection then concludes that Puntambekar et al. does not teach a method whereby a fixed thickness of silicon oxide will be removed from the oxide surface with the oxide thickness removed dependent upon the power level of the bias on the electrode in the etching chamber. With the exception of the omission of the modifier "rf" in front of the word "power", and the understanding that the rf bias is ultimately delivered to the semiconductor substrate through the electrode support, Applicants would probably agree with

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this assessment of what the Puntambekar et al. reference does *not* teach! Applicants would probably also state that the foregoing statement of what the reference does not teach comprises a good description of what comprises Applicants' invention. In other words, all parties should be able to agree, based on the above statements, that Applicants' process is what the Puntambekar et al. reference does *not* teach!

Applicants believe that what is being confused with regard to the applicability of the teachings of Puntambekar et al. versus the claimed invention is a confusion between **rf plasma power** versus **bias power or voltage**.

Rf plasma power is used by both the Applicants and the Puntambekar et al. reference to initiate and sustain the plasma (see Applicants discussion of plasma power on page 4, lines 3-11). However, **rf bias** is taught and claimed only by Applicants' as applied to their substrates; while the use of high DC voltage bias is taught or inferred by Puntambekar et al.

Applicants clearly teach the use of **low rf power bias** (100 watts or less) as their biasing means (page three, lines 1-21 of Applicants' specification); while Puntambekar et al. just as clearly teach the use of a **high DC voltage bias** as their biasing means (see column 4, lines 14-15 and 29). A low power rf bias not exceeding 100 watts, as claimed by Applicants, is simply not the same or suggested by a high voltage DC bias of at least 600 volts, as taught by the reference!

It should be further noted that Applicants have demonstrated, in their specification, that the amount of silicon oxide removed is a function of the power of their **rf bias** (see page 5, line 15 to page 6, line 7). In contrast, when Applicants' plasma generator power source is changed from 500 watts (page 5, lines 23-24) down to 250 watts (page 6, lines 8-12), Applicants state

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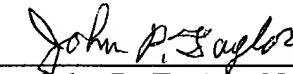
that the change in plasma power did not materially change the etch behavior. Once again, this demonstrates the novelty of Applicants' process over the reference, because the very rf power relied upon by the USPTO is shown to have no effect on the etch.

SUMMARY

For the foregoing reasons, Applicants' claimed invention is not suggested by the teachings of Puntambekar et al.; and claims 4-24 should, therefore, be allowable.

If the Examiner in charge of this case feels that there are any remaining unresolved issues in this case, the Examiner is urged to call the undersigned attorney at the below listed telephone number which is in the Pacific Coast Time Zone.

Respectfully Submitted,


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